

## **LISTING OF THE CLAIMS**

2. (Previously Presented) The conjugate of claim 44, wherein the molar ratio of the at least one vitamin D moiety to the at least one target molecule moiety is 1:1.

3. (Previously Presented) The conjugate of claim 44, wherein the vitamin D moiety is associated with the target molecule moiety via a connecting group.

4. (Original) The conjugate of claim 3, wherein the connecting group is a linkage group formed by modification of the vitamin D moiety and the target molecule moiety to form a bond therebetween.

5. (Original) The conjugate of claim 3, wherein the connecting group is a bifunctional connector.

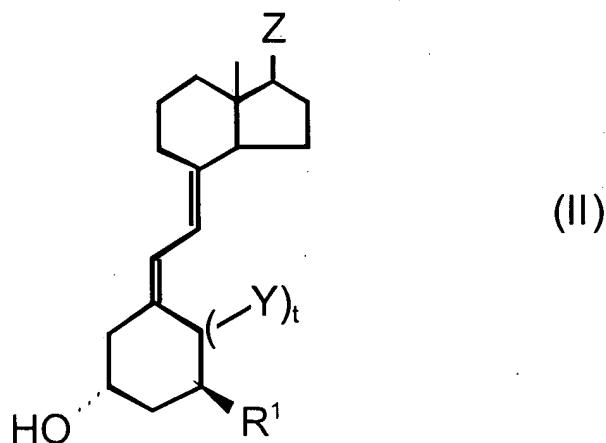
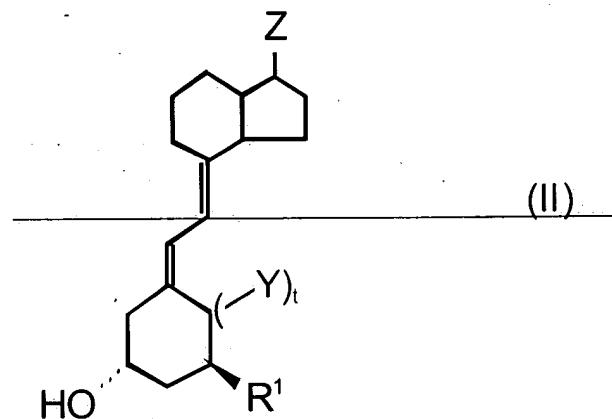
6. (Original) The conjugate of claim 3, wherein the vitamin D moiety is associated with the target molecule moiety via the connecting group and at least one additional connecting group.

11. (Original) The conjugate of claim 5, wherein the bifunctional connector is an amino acid chelated to the target molecule moiety and linked to the vitamin D moiety via an amide linkage.

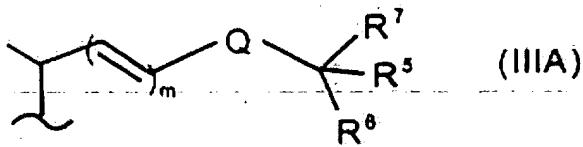
17. (Previously Presented) The conjugate of claim 44, further comprising at least one therapeutic agent other than a vitamin D moiety conjugated therewith.

18. (Original) The conjugate of claim 17, wherein the therapeutic agent is a bone-therapeutic agent selected from the group consisting of conjugated estrogens or their equivalents, antiestrogens, calcitonin, bisphosphonates, calcium supplements, cobalamin, pertussis toxin, boron, dehydroepiandrosterone, transforming bone growth factor beta, activin, and bone morphogenic protein.

20. (Amended Twice) A pharmaceutical composition comprising:  
a conjugate which includes at least one vitamin D moiety having the formula



wherein R<sup>1</sup> is H or OH; Z represents a ~~saturated or unsaturated, substituted or unsubstituted, straight chain or branched C1-C18 hydrocarbon~~ a side chain represented by formula (IIIa):



wherein  $m$  is 0 or 1;  $R^5$  is H or OH;  $R^6$  or  $R^7$  are independently H, OH, lower alkyl, lower fluoroalkyl,  $O$ -lower alkyl,  $O$ -lower acyl,  $O$ -aromatic alkyl, lower cycloalkyl or, taken together with the carbon to which they are bonded form a  $C_3$ - $C_8$  cyclohydrocarbon ring; and Q is  $-\text{C}=\text{C}-$ ,  $-\text{C}\equiv\text{C}-$ , or  $\text{R}^1-\text{R}^4-$ ,  $(-\text{C}-)_n$ , wherein  $n$  is 0 or an integer from 1 to 7,  $R^3$  is  $\text{CH}_3$  or H, and  $R^4$  is H or OH; Y is a  $=\text{CH}_2$  group; and  $t$  is 0 or 1,

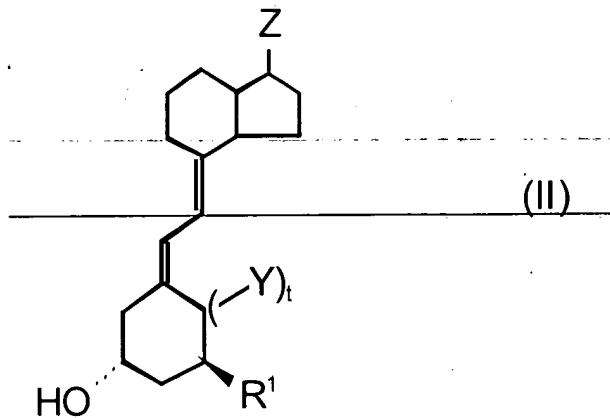
the vitamin D moiety being associated at at least one of the C-1, C-3, C-24 and C-25 position with at least one target molecule moiety having an affinity for a tissue of interest, the target molecule moiety comprising at least one of calcitonin, a bisphosphonate, a phosphate, polyaspartic acid, polyglutamic acid, an aminophosphosugar, osteonectin, bone sialoprotein, osteopontin, estrogen, dehydroepiandrosterone (DHEA), a metal ion-amino acid chelate, and combinations thereof, and

a suitable pharmaceutically acceptable carrier.

21. (Original) The pharmaceutical composition of claim 20, further comprising a differentially degradable coating encapsulating the conjugate for time release delivery of the conjugate.

22. (Original) The pharmaceutical composition of claim 21, wherein said coating is an enteric coating.

42. (Amended Twice) A conjugate comprising at least one vitamin D moiety having the formula

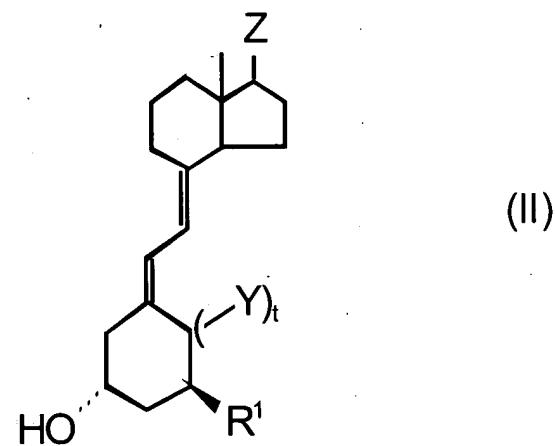
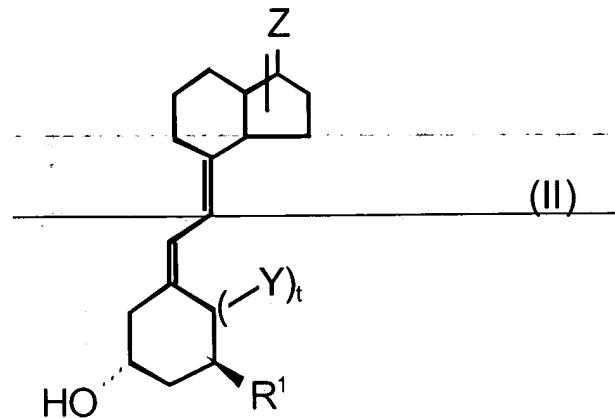


wherein  $R^+$  is H or OH; Z represents a saturated or unsaturated, substituted or unsubstituted, straight chain or branched  $C_1-C_{18}$  hydrocarbon group; Y is a  $=CH_2$  group; and t is 0 or 1,

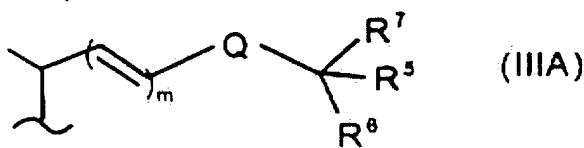
the vitamin D moiety being associated with a target molecule moiety having an affinity for a tissue of interest, the target molecule moiety comprising at least one of calcitonin, a bisphosphonate, a phosphate, polyaspartic acid, polyglutamic acid, an aminophosphosugar, osteonectin, bone sialoprotein, osteopontin, estrogen, dehydroepiandrosterone (DHEA), a metal ion amino acid chelate, and combinations thereof,

The conjugate of claim 44, wherein the conjugate comprises at least one of  $1\alpha$ -(OH)-24-aminoalkyl-1,1-bisphosphonate-D<sub>2</sub>, 1-aminoalkyl-1,1-bisphosphonate-24-(OH)-D<sub>2</sub>,  $1\alpha$ ,24-(OH)<sub>2</sub>-3-aminoalkyl-1,1-bisphosphonate-D<sub>2</sub>,  $1\alpha$ -aminoalkyl-1,1-bisphosphonate-25-(OH)-D<sub>3</sub>,  $1\alpha$ ,25-(OH)<sub>2</sub>-3-aminoalkyl-1,1-bisphosphonate-D<sub>3</sub>,  $1\alpha$ -(OH)-25-aminoalkyl-1,1-bisphosphonate-D<sub>3</sub>, or [and] combinations thereof, wherein the conjugate has an affinity for a tissue of interest.

44. (Amended Twice) A conjugate comprising at least one vitamin D moiety having the formula

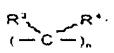


wherein  $R^1$  is H or OH; Z represents a saturated or unsaturated, substituted or unsubstituted, straight chain or branched C1-C18 hydrocarbon a side chain represented by formula (IIIA):



wherein m is  $R^8$  or 1;  $R^5$  is H, OH;  $R^6$  or  $R^7$  are independently H, OH, lower alkyl, lower fluoroalkyl, O-lower alkyl, O-lower acyl, O-aromatic alkyl, lower cycloalkyl or, taken together

with the carbon to which they are bonded form a C<sub>3</sub>-C<sub>8</sub> cyclohydrocarbon ring; and Q is

$-C=C-$ ,  $-C\equiv C-$ , or  $R^3$  , wherein n is 0 or an integer from 1 to 7, R<sup>3</sup> is CH<sub>3</sub> or H, and R<sup>4</sup> is H or OH; Y is a =CH<sub>2</sub> group; and t is 0 or 1,

the vitamin D moiety being associated at at least one of the C-1, C-3, C-24 and C-25 position with a target molecule moiety having an affinity for a tissue of interest, the target molecule moiety comprising at least one of calcitonin, a bisphosphonate, a phosphate, polyaspartic acid, polyglutamic acid, an aminophosphosugar, osteonectin, bone sialoprotein, osteopontin, estrogen, dehydroepiandrosterone (DHEA), a metal ion-amino acid chelate, and combinations thereof.

47. (Amended Twice) The conjugate of claim 44 [46], wherein said bisphosphonate is linked to said vitamin D moiety at a position on the vitamin D moiety which is C-1, C-3, C-24 or C-25.

49. (Previously Presented) The conjugate of claim 44, wherein the target molecule moiety comprises at least one of calcitonin, a bisphosphonate, a phosphate, osteonectin, osteopontin, estrogen, and dehydroepiandrosterone (DHEA) and combinations thereof.

50. (Previously Presented) The conjugate of claim 49, wherein the tissue of interest comprises at least one of bone, a malignancy site, and combination thereof.

51. (Previously Presented) The conjugate of claim 50, wherein the tissue of interest comprises bone.

52. (Previously Presented) The conjugate of claim 44, wherein the target molecule moiety comprises bisphosphonate.

53. (Previously Presented) The conjugate of claim 44, wherein the tissue of interest comprises bone.

54. (Previously Presented) The pharmaceutical composition of claim 20, wherein the target molecule moiety comprises at least one of calcitonin, a bisphosphonate, a phosphate, osteonectin, bone sialoprotein, osteopontin, estrogen, and dehydroepiandrosterone (DHEA) and combinations thereof.

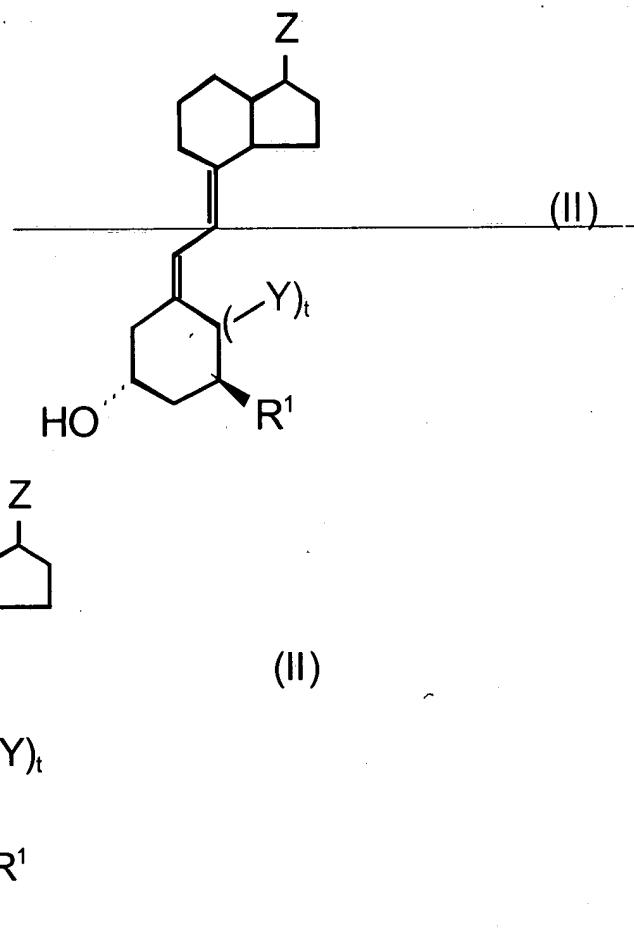
55. (Previously Presented) The pharmaceutical composition of claim 54, wherein the tissue of interest comprises at least one of bone, a malignancy site, and combination thereof.

56. (Previously Presented) The pharmaceutical composition of claim 55, wherein the tissue of interest comprises bone.

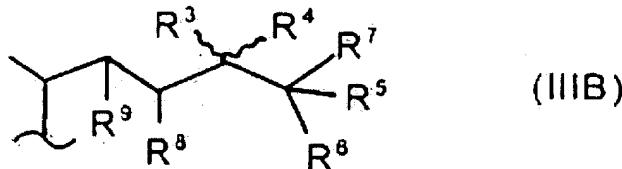
57. (Previously Presented) The pharmaceutical composition of claim 20, wherein the target molecule moiety comprises bisphosphonate.

58. (Previously Presented) The pharmaceutical composition of claim 20, wherein the tissue of interest comprises bone.

59. (Amended Twice) A conjugate comprising at least one vitamin D moiety having the formula



wherein R<sup>1</sup> is OH; a saturated or unsaturated, substituted or unsubstituted, straight chain or branched C1-C18 hydrocarbon a side chain represented by formula (IIIB):



wherein R<sup>8</sup> and R<sup>9</sup> are each H or taken together form a double bond between C-22 and C-23, R<sup>3</sup> is CH<sub>3</sub> or H; R<sup>4</sup> and R<sup>5</sup> are independently H or OH; and R<sup>6</sup> and R<sup>7</sup> are independently H, OH, lower alkyl, lower fluoroalkyl, O-lower alkyl, O-lower acyl, O-aromatic acyl, lower cycloalkyl or taken together with the carbon to which they are bonded to form a C<sub>3</sub>-C<sub>8</sub> cyclocarbon ring.

the vitamin D moiety being associated at at least one of the C-1, C-3, C-24 and C-25 position with a target molecule moiety having an affinity for a tissue of interest, the target molecule moiety comprising at least one of tetracycline, calcitonin, a bisphosphonate, a phosphate, polyaspartic acid, polyglutamic acid, an aminophosphosugar, osteonectin, bone sialoprotein, osteopontin, estrogen, dehydroepiandrosterone (DHEA), a metal ion-amino acid chelate, and combinations thereof, the target molecule binding or influencing the metabolism of the tissue of interest.

60. (Previously Presented) The conjugate of claim 59, wherein the target molecule moiety comprises at least one of calcitonin, a bisphosphonate, a phosphate, osteonectin, osteopontin, estrogen, and dehydroepiandrosterone (DHEA) and combinations thereof.

61. (Previously Presented) The conjugate of claim 60, wherein the tissue of interest comprises at least one of bone, a malignancy site, and combination thereof.

62. (Previously Presented) The conjugate of claim 61, wherein the tissue of interest comprises bone.

63. (Previously Presented) The conjugate of claim 59, wherein the target molecule moiety comprises bisphosphonate.

64. (Previously Presented) The conjugate of claim 58, wherein the tissue of interest comprises bone.